

Appendix E

Planimetric and Topographic Feature Depiction Specifications

This appendix contains guidance for depicting planimetric and topographic features based on the specified target scale. It is intended to consistently define the amount of feature density and detail required for a given scale, given the digitizing capabilities of a stereoplotter operating at that scale. Unique project-specific features not normally or routinely encoded (usually due to the extra cost thereof) must be independently identified and scheduled in a contract as a "special mapping requirement." These specifications have been developed for the nominal target scales shown in each section. They may be approximately expanded to cover the scale ranges shown. Should variations exist between these specifications and EM 1110-1-1807, EM 1110-1-1807 will govern. (These specifications were developed by Atlantic Aerial Surveys, Huntsville, AL, a member of the Management Association for Private Photogrammetric Surveyors.)

Section I

Feature Depiction Specifications

Nominal Scale: 50 Feet per Inch

Target Scale Range: 20 to 60 Feet per Inch

E-1. Transportation

Paved Road

Defined by edge of pavement, excluding paved shoulder or gutter. Paved road edge has precedence over paved drive or parking lot, and the edge of pavement should remain unbroken where drives or lots intersect road.

Unpaved Road

Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Unpaved road edge has precedence over unpaved drive or parking lot. Where unpaved road intersects a paved surface, the edge of pavement line has precedence, including slabs or sidewalks. Also use unpaved road for unpaved runways.

Railroad

Digitize center line of all rails in use (the line will be patterned to represent two rails 5 ft apart). Show all sidings and spurs (tracks for storage, etc.).

Abandoned Railroad

Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact (the line will be patterned to represent two rails 5 ft apart).

Bridge

Structure erected over obstacle or depression. "Bridge" includes automotive bridges, railroad bridges, foot-bridges, and viaducts. Continue all depictions across bridge, including edge of paved road and guardrail, if the item continues on the bridge. Do not contour bridges.

Runway

Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown with unpaved road symbology.

Retaining Wall (Major)

Fixed structure retaining earth located along thoroughfares. Digitize center line and pattern so ticks are on high side of wall. Major retaining wall has precedence over curb, fence, edge of pavement, and minor retaining wall. Snap contours to retaining walls.

Trail (Vehicular)

Dirt passageway that is permanent in nature and wider than 6 ft. Trails are not maintained as well as dirt roads; field roads shall be shown as trails. All transportation features have precedence over trails.

Curb

Raised edge defining edge of pavement, parking lot islands, etc. Curbs have precedence over edge of pavement lines. Retaining walls have precedence over curbs. Contours should run unbroken along curbs (do not snap to each side).

Concrete Barrier

Short wall erected between traffic lanes. Digitize center line of barrier.

Paved Shoulder

Pavement between edge of paved road and edge of total paved surface. Curb and guardrail have precedence over shoulder. Paved shoulder has precedence over sidewalk or slab, and should be broken for paved drives and parking lots. Do not show unpaved shoulders.

Paved Drive

Define by edge of pavement. Paved drive has precedence over unpaved road or drive, sidewalk, and slab. Paved road and retaining wall have precedence over paved drive. Paved shoulder should join cleanly with paved drive.

Unpaved Drive

Paved shoulder should not stop for unpaved drive. Edge of pavement of any kind has precedence over unpaved drive. Do not cap end of drive.

Pavement Change

Delineate change of pavement only between macadam and concrete surfaces. Do not show change between old and new asphalt, road repairs, etc.

Sidewalk

Show edges of all sidewalks, public or private. Sidewalk should not continue across paved drives unless it does so visibly on photography. Paved drive, parking lot, and road have precedence over sidewalk. Sidewalk has precedence over unpaved drive or parking lot and slab. Show steps (if requested) as miscellaneous structures.

Path

Visible, permanent dirt trail less than 6 ft wide, used commonly for bikes or pedestrian traffic. Digitize center line of path. Every element has precedence over trail.

Guardrail

Single- or double-sided box beam, corrugated steel, wooden, or cable guide rail. Guardrails are usually located in medians of roads or along road edges near hazards. Digitize center line of rail. For concrete barriers, use ornamental wall symbology.

Paved Parking

Digitize edge of pavement of parking lot and parking lot islands. Six-inch curb and retaining wall have precedence over paved parking. Paved drive should join cleanly with paved parking. Paved parking has precedence over unpaved drive or parking.

Unpaved Parking

Do not open paved shoulder for unpaved parking. Do not show islands in unpaved parking lots. Edge of pavement of any type has precedence over unpaved parking. Unpaved drive should join cleanly with unpaved parking.

Parking Bumper (Special Request Only)

Temporary structure, usually concrete, used to delineate parking. Digitize edge of bumper.

Paint Stripe (Special Request Only)

Digitize center line of stripes. Digitize outlines of very wide stripes and arrows, etc.

E-2. Structures

Building

"Building" includes residential or commercial trailers. Include covered porches, permanent overhangs, carport roofs, covered sidewalks, etc., as part of the building. Do not show common roof lines (e.g., between townhomes) or interior roof lines (e.g., dormers). All buildings are to end at the mapping contract boundary. Temporary structures are delineated as miscellaneous structures. Smokestacks are shown as buildings if free-standing.

Ruin or Under Construction Building

Delineate all visible building outlines, including foundation slabs or basement remains. Label "RUIN," "UNDER CONSTRUCTION," or "U/C," whichever is appropriate. Ruins other than buildings should be outlined as usual but labeled "RUIN" in addition to any required labels. See also "Area Under Construction."

Dam

Barrier across river, creek, or swamp to regulate or obstruct water flow. Visible beaver dams large enough to affect water flow shall be outlined also. Label "DAM."

Cemetery

Delineate cemetery boundary only if not bounded by a fence line. Show paved and unpaved drives and buildings. Do not show headstones or sidewalks. Label "CEMETERY."

Tank

Outline public utility tanks and industrial storage tanks. Show small propane tanks only if used for a business. Label "TANK," or "TANKS" if grouped together.

Silo

Cylindrical receptacle for farm product storage. Outline and label "SILO," or "SILOS" if grouped together.

Fence

Digitize center lines of all visible fences. Do not differentiate between fence and gate. If gate closes across road, pull fence across road. Do not show individual fence posts.

Residential Retaining Wall (Minor)

Fixed structure retaining earth, not located along a thoroughfare. Digitize center line and pattern so ticks are on high side of wall. Minor retaining wall has precedence over curb, fence, edge of pavement, and hydrology. Major retaining wall has precedence over minor retaining wall. Snap contours to retaining walls.

Ornamental Wall

Fixed structure of concrete or brick not used for retention of earth (if constructed of wood, delineate as fence). Digitize center line of wall. Ornamental wall has precedence over fence or cemetery. If wall is used solely as a sign (as in front of a business), delineate as a postless sign.

Slab

Any miscellaneous concrete slab, such as a flagpole base or concrete around swimming pool. Also use slab for patio. If slab is imbedded in a paved surface, outline as change of pavement. Slab has precedence over unpaved road.

Pool

Digitize interior edge of concrete around inground pools, and center line of walls in aboveground pools. Label "POOL." Also use "POOL" for aeration pools in industrial areas. Pool has precedence over slab and sidewalk symbology.

Miscellaneous Post

Pole greater than 6 ft in height, including basketball goals and unidentifiable poles. Digitize center of post.

Flagpole

Digitize center of pole. Look for slab at base.

Mail Box

Digitize center of mail box. Do not differentiate between collection boxes and delivery boxes.

Telephone Booth

Digitize center of booth or pedestal.

Broadcast Antenna

Radio or television tower. Digitize center of tower.

Satellite Dish

Digitize center of commercial and private satellite dishes. Do not show satellite dishes on top of buildings. Broadcast antenna has precedence over satellite dish.

Miscellaneous Structure

Minor buildings (air conditioner, tool storage shed, loading dock, deck, structures within substations, etc.). Do not label.

Miscellaneous Feature

Items not classified as minor buildings, such as conveyors or crane tracks. Label if identifiable.

Miscellaneous Circle

Unidentifiable circular item, such as gas filler cap. Do not label. Digitize center of item.

Miscellaneous Square

Unidentifiable square item, such as a corrugated metal valve cover; do not label. Digitize center of item.

Field Line (Special Request Only)

A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.

Golf Course

Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, sand traps, or flags except upon special request. Show all paved and unpaved drives (cart paths) that are permanent in nature. Show all hydrology and natural features. Label "GOLF COURSE" with only enough frequency for identification.

Athletic Field

Outline field only if not depicted by fence or slab. Show permanent basketball goals, football goal posts, etc., as miscellaneous posts. Do not show tennis court nets or posts for tennis court nets. Do not label. Show paved or unpaved tracks as paved or unpaved drives.

Debris

Scattered and unsorted material covering ground. Digitize outline of area and label "DEBRIS." Do not contour.

Storage

Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area and label "STORAGE." Do not contour piled areas or areas stacked so that the ground is not visible. Retaining wall symbology takes precedence over storage outline. Outline junkyards with storage line and label "JUNKYARD."

Quarry

Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline and label "QUARRY" with only enough frequency to identify feature. Contour inactive quarries only. Place spot elevations at lowest points of active quarries.

Area Under Construction

Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction, and any feature that has been completed (e.g., curb or completed building). Label "AREA UNDER CONSTRUCTION" or "AREA U/C." Do not show debris or storage within the area outline. Do not contour.

Pipeline

Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize edge; label "PIPE." Do not show supporting structures. Do not show pipes that do not touch the ground, such as between buildings.

Underground Pipeline (Special Request Only)

Digitize center line of apparent underground utility pipes. Label "U/G PIPE."

Levee

Earth wall for fluid retention, usually found along rivers or canals. Digitize outline of levee on planimetric maps only (contours define levees on topographic maps). Label "LEVEE."

Pier

Deck supported by posts extended over water. Digitize edge of pier. Label "PIER."

Riprap

Rocks placed along slopes to lessen erosion. Outline riprap area and label "RIPRAP." Contour general slope

of riprap with dashed contours to represent non-permanent irregular surface.

Jetty

Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs. Do not label. Place spot elevations at high and low points of jetty.

E-3. Natural Features

River

Navigable stream. Digitize shorelines.

Lake

A large inland body of usually fresh water. Show man-made reservoirs as lakes. Digitize shoreline. Join lake outline cleanly with river or creek line.

Pond

A body of standing water much smaller than a lake, often man-made. Digitize shoreline. Join pond outline cleanly with stream. If small pond is attached to a river or lake, include in river or lake outline.

Swamp

Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp and place cells in the swamp area. No distinction is made between a swamp, marsh, or inundated area. Show all vegetation within the swamp area.

Creek

Nonnavigable stream. Digitize shorelines of streams wider than 5 ft, and digitize center lines of streams narrower than 5 ft. Join creeks cleanly with rivers, lakes, or ponds. Do not pull tree mass lines across double-wide creeks.

Tree Mass

Group of trees too close together to allow individual plotting. Digitize edge of tree mass by following outline along the outer edge of the tree trunks. Tree mass lines cannot cross over any double-wide linear feature (e.g., vehicular trail, creek over 5 ft wide) or any railroad line, regardless of canopy spread. Tree mass has precedence over brush.

Tree

Single tree over 8 ft tall (except upon special request). Digitize center of base of tree trunk. No distinction is made between deciduous and coniferous trees. Tree symbol does not reflect extent of tree canopy. Do not plot single trees within a tree mass outline.

Tree Canopy (Special Request Only)

Digitize center of trunk and place canopy to show extent of branches.

Bush

Single bush less than 8 ft tall. Digitize center of bush. If many bushes are aligned together, use hedge row symbology. Bush symbol does not reflect width of bush. Do not show single bushes within a brush line. Do not show groups of flowers that may be interspersed with decorative bushes.

Brush

Trees under 8 ft tall, shrubs, and tall weeds thickly massed, usually found near forested areas, in unpopulated meadows or lots, or near rivers or creeks. Brush line may also be used for bushes that are too densely grouped to digitize individually. Do not outline decorative bushes or bush rows with brush. Instead, use hedge row and plot lone bushes. Tree mass has precedence over brush. Brush adjacent to a wooded area should close neatly with tree mass outline.

Hedge Row

Row of bushes close together, usually neatly maintained. Digitize center line of bush row.

E-4. Drainage Structures

Concrete Headwall

Concrete on the end of a transverse drain or pipe culvert. Digitize the center line of thin headwalls, such as those on ditches or under driveways. Digitize outer edge of thicker and larger headwalls. Headwalls have precedence over culvert symbology.

Culvert

Pipe drain, usually located under roads or driveways. Digitize length of pipe from center of each end. Do not show culverts if cement headwalls are present.

Paved Ditch

Digitize outer edge of paved ditch. Do not show water line inside ditch. Retaining wall has precedence over paved ditch. Paved ditch has precedence over sidewalk

or slab. Cap ends or join cleanly with headwalls, if present.

Unpaved Ditch

Man-made channel for drainage. On planimetric maps, digitize the center line of all apparent ditches. On topographic maps, digitize the center line of ditches wider than 5 ft or if the ditches contain water.

Circular Catch Basin

Round drainage grating. Digitize center of catch basin. Do not label.

Square Catch Basin

Small rectangular or square drainage grate. Digitize center of catch basin. Do not label.

Curb Inlet

Drainage opening beneath a curb and interrupting the gutter. Frequently curb inlets have a manhole directly above them. Digitize center of curb inlet and orient symbol along the curb. Do not interrupt curb symbology.

E-5. Signs and Traffic Control

Single Leg Sign

Digitize center of signpost. Orient face of sign to correspond to its true position, if identifiable.

Double Leg Sign

Includes multileg signs and overhead signs. Digitize center of each leg. Label overhead signs "O/H."

Traffic Signal Pole

Digitize center of post. Traffic signal symbology has precedence over light pole symbology if post has a dual purpose. Do not show signals suspended over roads.

Billboard

Digitize center of each leg. Label "BB."

Railroad Signal Pole

Lights along rural tracks to guide trains or warning lights near track intersections with roads. Digitize center of post.

E-6. Utilities

Power Pole

Utility pole from which power, telephone, or cable television lines are suspended. Digitize center of pole. Power pole has precedence over light pole if the pole has a dual purpose. Traffic signal pole has precedence over power pole.

Light Pole

Pole supporting a street light. If the pole has power lines also, digitize as a power pole. Digitize the center of the light pole. Do not differentiate between street lights and parking lot lights.

Yard Light

Very short lights, usually located around sidewalks at businesses or residences. Digitize center of light.

Transmission Tower

Large structure for supporting power lines across long distances. Digitize base of tower.

Substation

High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures. Substation outline has precedence over slab, unpaved drive, and trail. Do not show individual poles, pipes, or transformers within substation boundary. Label "SUBSTATION."

Runway Light

Digitize center of visible runway and taxiway lights. Do not show reflectors.

Electric Box

Digitize center of structure.

Fire Hydrant

Digitize center of element.

Manhole

A hole through which one can enter a sewer, conduit, etc. Manholes may be located on paved or unpaved surfaces. Digitize center of manhole.

E-7. Contours

a. Rules for contours (general).

(1) Break contours for (and do not contour) man-made structures that do not conform to the ground (e.g., buildings, retaining walls, bridges, etc.). Contours should join cleanly to these features.

(2) Do not contour active quarries, areas under construction, debris piles, or storage piles. Contours should join cleanly to these features.

(3) Contours should turn back on single-line streams and should cross double-wide streams as a straight line from shore to shore.

b. Rules for depression contours. A depression is a contour that closes within the mapping limits (or obviously closes outside the mapping limits on the stereo model) such that the area enclosed by the contour is lower than the contour elevation. Depressions often occur around catch basins. If the contour turns back on a stream or ditch into a culvert or headwall, it is not a depression unless it closes on the other side of the culvert or headwall or under the road.

Index Contour

Every fifth contour shall be annotated and shall have a thicker line weight than intermediate contours. Do not break index contours for spot elevations unless absolutely necessary for legibility. Do not drop index contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

Hidden Index Contour

Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

Depressed Index Contour

See *b* above. Follow the same guidelines as for index contours.

Hidden Depressed Index Contour

Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

Index Contour Label

Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation. Intermediates may be broken for index labels if necessary.

Intermediate Contour

Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale. Intermediates should

not run through spot elevations. Intermediates can be broken for other text as well.

Hidden Intermediate Contour

Intermediate contour that is obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

Depressed Intermediate Contour

See *b* above. Follow the same guidelines as for intermediate contours.

Hidden Depressed Intermediate Contour

Depressed intermediate contour obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

Spot Elevation

Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

- (1) All road and/or railroad intersections.
- (2) At each end of bridges on center line of road.
- (3) At center line of roads above culverts.
- (4) At the highest point of closed contour tops.
- (5) At the lowest point of closed depressions, significant saddles, and quarries.
- (6) At points visible through dense vegetation in obscured areas.
- (7) Any necessary place such that in no place is there more than 2 in. (at map scale) between contours and/or spot elevations.

Indexes, intermediates, and tree mass patterns are the only features to be broken for spot elevation text. Spot elevations are to be rotated to be parallel to the bottom of the sheets unless otherwise requested.

Water Elevation

Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

E-8. Manuscript Data

Contour Limit Line

Show line only if project has adjacent areas of planimetric and topographic detail. Contours should end exactly upon this line. Also show a contour limit line between adjacent areas where the contour interval changes.

Match Line

Place line at edge of graphic detail to allow for a butt match to adjacent sheets. Place only on edges where matching sheets exist.

Model Limit Line

Digitize edge; pull all detail cleanly to line. Do not plot model limit lines on final plots.

Horizontal Control Point

Place at coordinates and label. Show only if horizontal control is separate from vertical control.

Vertical Control Point

Place at its true position during stereocompilation and label. Show only if horizontal control is separate from vertical control.

Control Point

Point used for both horizontal and vertical control. Place at coordinates and label.

Control Point Annotation

List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

Grid Tick

Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

Grid Lines (Special Request Only)

Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

Grid Annotation

Place as appropriate. Use commas.

Standard Border

Center border around graphic detail. List project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

Section II

Feature Depiction Specifications

Nominal Scale: 100 Feet per Inch

Target Scale Range: 80 to 160 Feet per Inch

E-9. Transportation

Paved Road

Defined by edge of pavement, excluding paved shoulder or gutter. Paved road edge has precedence over paved drive or parking lot, and the edge of pavement should remain unbroken where drives or lots intersect road.

Unpaved Road

Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Unpaved road edge has precedence over unpaved drive or parking lot. Where unpaved road intersects a paved surface, the edge of pavement line has precedence, including slabs or sidewalks. Use unpaved road for unpaved runways.

Railroad

Digitize center line of all rails in use. Show all sidings and spurs (tracks for storage, etc.).

Abandoned Railroad

Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.

Bridge

Structure erected over obstacle or depression. "Bridge" includes automotive bridges, railroad bridges, public footbridges, and viaducts. Continue all depictions across bridge, including edge of paved road and guardrail, if the item continues on the bridge. Do not contour bridges.

Runway

Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown as unpaved roads.

Retaining Wall (Major)

Fixed structure retaining earth located along thoroughfares. Digitize center line and pattern so ticks are on high side of wall. Major retaining wall has precedence over fence, edge of pavement, and minor retaining wall. Snap contours to retaining walls.

Trail (Vehicular)

Dirt passageway that is permanent in nature and wider than 8 ft. Trails are not maintained as well as dirt roads; field roads shall be shown as trails. All transportation features have precedence over trails.

Concrete Barrier

Short wall erected between traffic lanes. Digitize center line of barrier.

Paved Drive

Define by edge of pavement. Paved drive has precedence over unpaved road or drive, sidewalk and slab. Paved road and retaining wall have precedence over paved drive.

Unpaved Drive

Edge of pavement of any kind has precedence over unpaved drive. Do not cap end of drive.

Sidewalk

Show edges of all public sidewalks. Sidewalk should not continue across paved drives unless it does so visibly on photography. Paved drive, parking lot, and road have precedence over sidewalk. Sidewalk has precedence over unpaved drive or parking lot and slab. Do not show steps at all.

Path

Visible, permanent dirt trail less than 8 ft wide, used commonly for bikes or pedestrian traffic. Digitize center line of path. Every element has precedence over path.

Guardrail

Single- or double-sided box beam, corrugated steel, wooden, or cable guide rail. Guard rails are usually located in medians of roads or along road edges near hazards. Digitize center line of rail. For concrete barriers, use ornamental wall symbology.

Paved Parking

Digitize edge of pavement of parking lot and parking lot islands. Retaining wall has precedence over paved parking. Paved drive should join cleanly with paved parking. Paved parking has precedence over unpaved drive or parking.

Unpaved Parking

Do not open paved surface for unpaved parking. Do not show islands in unpaved parking lots. Edge of pavement of any type has precedence over unpaved parking.

Unpaved drive should join cleanly with unpaved parking.

E-10. Structures

Building

"Building" includes residential or commercial trailers. Include covered porches, permanent overhangs, carport roofs, covered sidewalks, etc., as part of the building. Do not show common roof lines (e.g., between town-homes) or interior roof lines (e.g., dormers). All buildings are to end at the mapping contract boundary. Temporary structures are delineated as miscellaneous structures. Smokestacks are shown as buildings if freestanding.

Ruin or Under Construction Building

Delineate all visible building outlines, including foundation slabs or basement remains. Label "RUIN," "UNDER CONSTRUCTION," or "U/C," whichever is appropriate. Ruins other than buildings should be outlined as usual but labeled "RUIN" in addition to any required labels. See also "Area Under Construction."

Dam

Barrier across river, creek, or swamp to regulate or obstruct water flow. Visible beaver dams large enough to affect water flow shall be outlined also. Label "DAM."

Cemetery

Delineate cemetery boundary only if not bounded by a fence line. Show paved and unpaved drives and buildings. Do not show headstones or sidewalks. Label "CEMETERY."

Tank

Public utility storage tank. Digitize edge of tank. Label "TANK."

Silo

Large cylindrical receptacle for farm product storage. Label "SILO."

Fence

Digitize center lines of property line fences. Do not differentiate between fence and gate. If gate closes across road, pull fence across road. Do not show individual fence posts.

Residential Retaining Wall (Minor)

Fixed structure retaining earth, not located along a thoroughfare. Digitize center line of walls over 10 ft long and pattern so ticks are on high side of wall. Minor retaining wall has precedence over fence, edge of pavement, and hydrology. Major retaining wall has precedence over minor retaining wall. Snap contours to retaining walls.

Ornamental Wall

Fixed structure of concrete or brick not used for retention of earth (if constructed of wood, delineate as fence). Digitize center line of walls over 10 ft long. Ornamental wall has precedence over fence or cemetery. If wall is used solely as a sign (as in front of a business) delineate as a postless sign.

Slab (Greater Than 8 ft × 8 ft)

Any miscellaneous concrete slab, such as a flagpole base or concrete around swimming pool. Slab has precedence over unpaved road.

Pool

Digitize interior edge of concrete around inground pools. Label "POOL." Also use pool for aeration pools in industrial areas. Pool has precedence over slab and sidewalk symbology.

Flagpole

Digitize center of identifiable public flagpoles.

Broadcast Antenna

Radio or television tower. Digitize center of tower.

Commercial Satellite Dish

Digitize center of commercial satellite dishes. Do not show satellite dishes on top of buildings. Broadcast antenna has precedence over satellite dish.

Miscellaneous Structure

Minor buildings (air conditioner, tool storage shed, loading dock, deck, structures within substations, etc.). Do not label.

Miscellaneous Feature

Items not classified as minor buildings, such as conveyors or crane tracks. Label if identifiable.

Miscellaneous Circle

Unidentifiable circular item, such as gas filler cap. Do not label. Digitize center of item.

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Miscellaneous Square

Unidentifiable square item, such as a corrugated metal valve cover. Do not label. Digitize center of item.

Field Line (Special Request Only)

A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.

Golf Course

Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, sand traps, or flags except upon special request. Show all paved and unpaved drives (cart paths) that are permanent in nature. Show all hydrology and natural features. Label "GOLF COURSE" with only enough frequency for identification.

Athletic Field

Outline field only if not depicted by fence or slab. Do not show basketball goals, football goal posts, tennis court nets, or posts for tennis court nets. Do not label. Show paved or unpaved tracks as paved or unpaved drives.

Debris (Greater Than 10 ft × 10 ft)

Scattered and unsorted material covering ground. Digitize outline of area and label "DEBRIS." Do not contour.

Storage (Greater Than 10 ft × 10 ft)

Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area and label "STORAGE." Do not contour piled areas or areas stacked so that the ground is not visible. Retaining wall symbology takes precedence over storage outline. Outline junkyards with storage line and label "JUNKYARD."

Quarry

Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline and label "QUARRY" with only enough frequency to identify feature. Contour inactive quarries only. Place spot elevations at lowest points of active quarries.

Area Under Construction

Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction and any feature that has been completed (e.g., completed building). Label "AREA UNDER CONSTRUCTION" or "AREA U/C."

Do not show debris or storage within the area outline. Do not contour.

Pipeline

Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize edge; label "PIPE." Do not show supporting structures. Do not show pipes that do not touch ground.

Underground Pipeline (Special Request Only)

Digitize center line of apparent underground utility pipes. Label "U/G PIPE."

Levee

Earth wall for fluid retention, usually found along rivers or canals. Digitize outline of levee on planimetric maps only (contours define levees on topographic maps). Label "LEVEE."

Pier

Deck supported by posts extended over water. Digitize edge of pier. Do not show private piers behind residential homes. Label "PIER."

Riprap

Rocks placed along slopes to lessen erosion. Outline riprap area and label "RIPRAP." Contour general slope of riprap with dashed contours to represent nonpermanent irregular surface.

Jetty

Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs. Do not label. Place spot elevations at high and low points of jetty.

E-11. Natural Features

River

Navigable stream. Digitize shorelines.

Lake

A large inland body of usually fresh water. Show man-made reservoirs as lakes. Digitize shoreline. Join lake outline cleanly with river or creek line.

Pond

A body of standing water much smaller than a lake, often man-made. Digitize shoreline. Join pond outline cleanly with stream. If small pond is attached to a river or lake, include in river or lake outline.

Swamp

Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp and place cells in the swamp area. No distinction is made between a swamp, marsh, or inundated area. Show all vegetation within the swamp area.

Creek

Nonnavigable stream. Digitize shorelines of streams wider than 10 ft, and digitize center lines of streams narrower than 10 ft. Join creeks cleanly with rivers, lakes, or ponds. Do not pull tree mass lines across double-wide creeks.

Tree Mass

Group of trees too close together to allow individual plotting. Digitize edge of tree mass by following outline along the outer edge of the tree trunks. Tree mass lines cannot cross over any double-wide linear feature (e.g., vehicular trail, creek over 10 ft wide) or any railroad line, regardless of canopy spread.

Tree

Single tree over 10 ft tall. Digitize center of base of tree trunk. No distinction is made unless specially requested between deciduous and coniferous trees. Tree symbol does not reflect extent of tree canopy. Do not plot single trees within a tree mass outline.

Tree Canopy (Special Request Only)

Digitize center of trunk and place canopy to show extent of branches.

Brush

Trees under 10 ft tall, tall weeds, or other vegetation usually found in unpopulated meadows, near forested areas, or near rivers or creeks. Outline brush only if it is dense enough to obscure ground. Tree mass outline has precedence over brush; brush adjacent to a wooded area should close cleanly to tree mass outline.

E-12. Drainage Structures

Culvert (Over 5 ft Wide)

Pipe drain located under roads. Digitize center of each end of pipe. Do not show culverts if headwalls are present.

Concrete Headwall

Concrete on the end of a transverse drain or pipe culvert. Digitize the center lines of headwalls less than 10 ft long. Digitize outer edge of thicker and larger headwalls. Headwalls have precedence over culvert symbology.

Paved Side Ditch

Digitize outer edge of paved ditch. Do not show water line inside ditch. Retaining wall has precedence over paved ditch. Paved ditch has precedence over sidewalk or slab. Cap ends or join cleanly with headwalls, if present.

Catch Basin

Symbolize all visible catch basins as square catch basins. Digitize center.

E-13. Signs and Traffic Control

Billboard

Digitize the center of each post of billboard. Label "BB."

E-14. Utilities

Power Pole

Utility pole from which power, telephone, or cable television lines are suspended. Digitize center of pole.

Transmission Tower

Large structure for supporting power lines across long distances. Digitize base of tower.

Substation

High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures. Substation outline has precedence over slab, unpaved drive, and trail. Do not show individual poles, pipes, or transformers within substation boundary. Label "SUBSTATION."

Light Pole

Digitize center of street lights along roads. Do not show lights in parking lots or yard lights. Show lone, large light poles also (such as stadium lights or large lights at ballfields).

E-15. Contours

Index Contour

Every fifth contour shall be annotated and shall have a thicker line weight than intermediate contours. Do not break index contours for spot elevations unless absolutely necessary for legibility. Do not drop index contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

Hidden Index Contour

Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

Depressed Index Contour

See E-7b above. Follow the same guidelines as for index contours.

Hidden Depressed Index Contour

Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

Index Contour Label

Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation. Intermediates may be broken for index labels if necessary.

Intermediate Contour

Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale. Intermediates should not run through spot elevations. Intermediates can be broken for other text as well.

Hidden Intermediate Contour

Intermediate contour that is obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

Depressed Intermediate Contour

See E-7b above. Follow the same guidelines as for intermediate contours.

Hidden Depressed Intermediate Contour

Depressed intermediate contour obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

Spot Elevation

Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

- (1) All road and/or railroad intersections.
- (2) At each end of bridges on center line of road.
- (3) At center line of roads above culverts.
- (4) At the highest point of closed contour tops.
- (5) At the lowest point of closed depressions, significant saddles, and quarries.
- (6) At points visible through dense vegetation in obscured areas.
- (7) Any necessary place such that in no place is there more than 2 in. (at map scale) between contours and/or spot elevations.

Indexes, intermediates, and tree mass patterns are the only features to be broken for spot elevation text. Spot elevations are to be rotated parallel to the bottom of the sheets unless otherwise requested.

Water Elevation

Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

E-16. Manuscript Data

Contour Limit Line

Show line only if project has adjacent areas of planimetric and topographic detail. Contours should end exactly upon this line. Also show a contour limit line between adjacent areas where the contour interval changes.

Match Line

Place line at edge of graphic detail to allow for a butt match to adjacent sheets. Place only on edges where matching sheets exist.

Model Limit Line

Digitize edge; pull all detail cleanly to line. Do not plot model limit lines on final plots.

Horizontal Control Point

Place at coordinates and label. Show only if horizontal control is separate from vertical control.

Vertical Control Point

Place at its true position during stereocompilation and label. Show only if horizontal control is separate from vertical control.

Control Point

Point used for both horizontal and vertical control. Place at coordinates and label.

Control Point Annotation

List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

Grid Tick

Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

Grid Lines (Special Request Only)

Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

Grid Annotation

Place as appropriate. Use commas.

Standard Border

Center border around graphic detail. List project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

Section III

Feature Depiction Specifications

Nominal Scale: 200 Feet per Inch

Target Scale Range: 180 to 320 Feet per Inch

E-17. TRANSPORTATION

Paved Road

Defined by edge of pavement, excluding paved shoulder or gutter. Paved road edge has precedence over paved drive or parking lot, and the edge of pavement should remain unbroken where drives or lots intersect road.

Unpaved Road

Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved

roads. Define by edge of graded surface or edge of tire wear lines, whichever is appropriate. Unpaved road edge has precedence over unpaved drive or parking lot. Use unpaved road symbology for unpaved runways.

Railroad

Digitize center line of all rails in use. Do not show sidings and spurs (tracks for storage, etc.).

Abandoned Railroad

Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.

Bridge

Structure erected over obstacle or depression. Digitize general shape of bridge. "Bridge" includes automotive bridges, railroad bridges, and viaducts. Continue all depictions across bridge, including edge of paved road, if item continues on the bridge. Do not contour bridges.

Runway

Airport pavement used for takeoff, landing, or taxiing of airplanes. "Runway" also includes helipads. Unpaved runways shall be shown as unpaved roads.

Retaining Wall (Major)

Fixed structure retaining earth located along thoroughfares. Digitize center line and pattern so ticks are on high side of wall. Major retaining wall has precedence over fence, edge of pavement, and minor retaining wall. Snap contours to retaining walls.

Trail

Visible, permanent dirt passageway greater than 200 ft long. Digitize center line of trail.

Paved Drive Over 200 ft Long

Define by edge of pavement. Paved drive has precedence over unpaved road or drive. Paved road and retaining wall have precedence over paved drive.

Unpaved Drive Over 200 ft Long

Edge of pavement of any kind has precedence over unpaved drive. Do not cap end of drive.

Commercial Paved Parking Over 200 ft Long

Digitize edge of parking lot; do not show parking lot islands. Retaining wall has precedence over paved parking. Paved drive should join cleanly with paved parking. Paved parking has precedence over unpaved drive or parking.

Commercial Unpaved Parking Over 200 ft Long

Do not open paved surface for unpaved parking. Do not show islands in unpaved parking lots. Edge of pavement of any type has precedence over unpaved parking. Unpaved drive should join cleanly with unpaved parking.

Guardrail Over 200 ft Long

Digitize center line of any visible guardrails.

E-18. Structures

Building

"Building" includes visible lone residential or commercial trailers. Include covered porches, permanent overhangs, carport roofs, etc., as part of the building. All buildings are to end at the mapping contract boundary. Smokestacks are shown as buildings if freestanding.

Trailer Park

Digitize edge of trailer park as apparent from lot location, property lines, and other clues. Do not show trailers within trailer parks; do show buildings within parks if present. Show drives over 200 ft long. Label "Trailer Park."

Ruin or Under Construction Building

Delineate visible building outlines, including foundation slabs or basement remains. Label "RUIN," "UNDER CONSTRUCTION," or "U/C," whichever is appropriate. Ruins other than buildings should be outlined as usual but labeled "RUIN" in addition to any required labels. See also "Area Under Construction."

Tank (Visible)

Public utility storage tank. Digitize edge of tank. Label "TANK."

Silo (Visible)

Large cylindrical receptacle for farm product storage. Label "SILO."

Dam

Barrier across river, creek, or swamp to regulate or obstruct water flow. Label "Dam."

Cemetery

Delineate cemetery boundary only if not bounded by a fence line. Show paved and unpaved drives and buildings. Do not show headstones or sidewalks. Label "Cemetery."

Fence

Digitize center lines of visible back property line and cross-country fences.

Residential Retaining Wall (Minor)

Fixed structure retaining earth, not located along a thoroughfare. Digitize center line of walls over 20 ft long and pattern so ticks are on high side of wall. Minor retaining wall has precedence over fence, edge of pavement, and hydrology. Major retaining wall has precedence over minor retaining wall. Snap contours to retaining walls.

Ornamental Wall

Fixed structure of concrete or brick not used for retention of earth. Digitize center line of walls over 20 ft long. Ornamental wall has precedence over fence or cemetery.

Visible Public Pool

Digitize interior edge of concrete around inground pools. Label "POOL." Also use pool for aeration pools in industrial areas.

Broadcast Antenna

Radio or television tower. Digitize center of tower.

Miscellaneous Feature

Items not classified as minor buildings, such as conveyors or crane tracks. Label if identifiable.

Field Line (Special Request Only)

A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.

Golf Course

Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, or sand traps except upon special request. Show all paved drives (cart paths) that are permanent in nature. Show all hydrology and natural features. Label "GOLF COURSE" with only enough frequency for identification.

Athletic Field

Outline field only if not depicted by fence. Do not label. Show paved or unpaved tracks as paved or unpaved drives.

Debris (Greater Than 20 ft × 20 ft)

Scattered and unsorted material completely obscuring ground. Digitize outline of area and label "DEBRIS." Do not contour.

Storage

Stacked material or piles of dirt, sand, gravel, salt, etc. Digitize outline of area and label "STORAGE." Do not contour piled areas or areas stacked so that the ground is not visible. Retaining wall symbology takes precedence over storage outline. Outline junkyards with storage line and label "JUNKYARD."

Quarry

Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline and label "QUARRY" with only enough frequency to identify feature. Contour inactive quarries only. Place spot elevations at lowest points of active quarries.

Area Under Construction

Digitize outline of entire area under construction. Show any roads under construction as unpaved roads. Digitize buildings under construction and any feature that has been completed (e.g., completed building). Label "AREA UNDER CONSTRUCTION" or "AREA U/C." Do not show debris or storage within the area outline. Do not contour.

Pipeline

Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize center line, label "PIPE." Do not show supporting structures.

Underground Pipeline

Digitize center line of apparent underground utility pipelines. Label "U/G PIPE."

Levee

Earth wall for fluid retention, usually found along rivers or canals. Digitize outer edge of levee on planimetric maps only (contours define levees on topographic maps). Label "LEVEE."

Commercial Pier

Deck supported by posts extended over water. Digitize edge of pier. Do not show private piers. Label "PIER."

Riprap (Over 20 ft x 20 ft)

Rocks placed along slopes to lessen erosion. Outline large riprap area and label "RIPRAP." Contour general slope of riprap with dashed contours to represent non-permanent irregular surface.

Jetty

Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs. Do not label. Place spot elevations at high and low points of jetty.

E-19. Natural Features

River

Navigable stream. Digitize shorelines.

Lake

A large inland body of usually fresh water. Show man-made reservoirs as lakes. Digitize shoreline. Join lake outline cleanly with river or creek line.

Pond

A body of standing water much smaller than a lake, often man-made. Digitize shoreline. Join pond outline cleanly with stream. If small pond is attached to a river or lake, include in river or lake outline.

Swamp

Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp and place cells in the swamp area. No distinction is made between a swamp, marsh, or inundated area. Show all vegetation within the swamp area.

Creek

Nonnavigable stream. Digitize shorelines of streams wider than 15 ft, and digitize center lines of streams narrower than 15 ft. Join creeks cleanly with rivers, lakes, or ponds. Do not pull tree mass lines across double-wide creeks.

Tree Mass

Group of trees too close together to allow individual plotting. Digitize edge of tree mass by following outline along the outer edge of the tree trunks. Tree mass lines cannot cross over any double-wide linear feature (e.g., vehicular trail, creek over 15 ft wide) or any railroad line, regardless of canopy spread.

E-20. Drainage Structures

Concrete Headwall

Concrete on the end of a transverse drain or pipe

culvert. Digitize the center of headwalls less than 20 ft long. Digitize outer edge of thicker and larger headwalls.

Paved Ditch

Digitize center line of paved ditch. Do not show water line inside ditch. Retaining wall has precedence over paved ditch. Cap ends or join cleanly with headwalls, if present.

E-21. Utilities

Power Pole

Utility pole from which power, telephone, or cable television lines are suspended. Digitize center of pole.

Transmission Tower

Large structure for supporting power lines across long distances. Digitize base of tower.

Substation Greater Than 20 ft × 20 ft

High-voltage units grouped together, usually within a fence. Digitize outline if not enclosed by fence. Show large structures within substations as miscellaneous structures. Substation outline has precedence over slab, unpaved drive, and trail. Do not show individual poles, pipes, or transformers within substation boundary. Label "SUBSTATION."

E-22. Contours

Index Contour

Every fifth contour shall be annotated and shall have a thicker line weight than intermediate contours. Do not break index contours for spot elevations unless absolutely necessary for legibility. Do not drop index contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

Hidden Index Contour

Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

Depressed Index Contour

See E-7*b* above. Follow the same guidelines as for index contours.

Hidden Depressed Index Contour

Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

Index Contour Label

Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation. Intermediates may be broken for index labels if necessary.

Intermediate Contour

Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale. Intermediates should not run through spot elevations. Intermediates can be broken for other text as well.

Hidden Intermediate Contour

Intermediate contour that is obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

Depressed Intermediate Contour

See E-7*b* above. Follow the same guidelines as for intermediate contours.

Hidden Depressed Intermediate Contour

Depressed intermediate contour obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

Spot Elevation

Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

- (1) All road and/or railroad intersections.
- (2) At each end of bridges on center line of road.
- (3) At center line of roads above culverts.
- (4) At the highest point of closed contour tops.
- (5) At the lowest point of closed depressions, significant saddles, and quarries.
- (6) At points visible through dense vegetation in obscured areas.

(7) At any location necessary to provide that no more than 2 in. exist between any contour and/or spot elevation.

Indexes, intermediates, and tree mass patterns are the only features to be broken for spot elevation text. Spot elevations are to be rotated parallel to the bottom of the sheets unless otherwise requested.

Water Elevation

Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

E-23. Manuscript Data

Contour Limit Line

Show line only if project has adjacent areas of planimetric and topographic detail. Contours should end exactly upon this line. Also show a contour limit line between adjacent areas where the contour interval changes.

Match Line

Place line at edge of graphic detail to allow for a butt match to adjacent sheets. Place only on edges where matching sheets exist.

Model Limit Line

Digitize edge; pull all detail cleanly to line. Do not plot model limit lines on final plots.

Horizontal Control Point

Place at coordinates and label. Show only if horizontal control is separate from vertical control.

Vertical Control Point

Place at its true position during stereocompilation and label. Show only if horizontal control is separate from vertical control.

Control Point

Point used for both horizontal and vertical control. Place at coordinates and label.

Control Point Annotation

List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

Grid Tick

Place grid tick at grid line intersections (every 5 in. at

map scale). Label outside of graphic detail such that each grid is labeled once.

Grid Lines (Special Request Only)

Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

Grid Annotation

Place as appropriate. Use commas.

Standard Border

Center border around graphic detail. List project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.

Section IV

Feature Depiction Specifications

Nominal Scale: 400 Feet per Inch

Target Scale Range: 340 to 500 Feet per Inch

E-24. Transportation

Paved Road

Defined by edge of pavement, excluding paved shoulder or gutter. Paved road edge has precedence over paved drive or parking lot, and the edge of pavement should remain unbroken where drives or lots intersect road.

Unpaved Road (Visible)

Dirt or gravel road maintained as a thoroughfare. Unpaved roads are frequently found in rural areas or in suburban areas. Unpaved alleys are depicted as unpaved roads. Unpaved road edge has precedence over unpaved drive or parking lot. Use unpaved road symbology to depict unpaved runways.

Railroad

Digitize center line of visible rails in use. Do not show sidings and spurs (tracks for storage, etc.).

Abandoned Railroad (Visible)

Digitize center line of all abandoned railroads with tracks still intact and visible. Do not delineate old railroad grades with no tracks intact.

Bridge

Structure erected over obstacle or depression. Digitize general shape of bridge. Do not contour.

Runway

Airport pavement used for takeoff, landing, or taxiing of

airplanes. "Runway" also includes visible helipads. Show unpaved runways with unpaved road symbology.

Retaining Wall (Major)

Fixed structure retaining earth located along thoroughfares. Digitize center line and pattern so ticks are on high side of wall. Major retaining wall has precedence over fence, edge of pavement, and minor retaining wall. Snap contours to retaining walls.

Paved Drive Over 400 ft Long

Define by edge of pavement. Paved drive has precedence over unpaved road or drive. Paved road and retaining wall have precedence over paved drive.

Unpaved Drive Over 400 ft Long

Edge of pavement of any kind has precedence over unpaved drive. Do not cap end of drive.

Commercial Paved Parking Over 400 ft Long

Digitize edge of pavement of parking lot; do not show islands. Retaining wall has precedence over paved parking. Paved drive should join cleanly with paved parking. Paved parking has precedence over unpaved drive or parking.

Commercial Unpaved Parking Over 400 ft Long

Do not open paved surface for unpaved parking. Do not show islands in unpaved parking lots. Edge of pavement of any type has precedence over unpaved parking. Unpaved drive should join cleanly with unpaved parking.

E-25. Structures

Building

Digitize general shape of buildings over 40 ft x 40 ft. Do not show trailers at all. All buildings are to end at the mapping contract boundary. Visible smokestacks are shown as buildings if freestanding.

Ruin or Under Construction Building

Delineate all visible building outlines, including foundation slabs or basement remains. Label "RUIN," "UNDER CONSTRUCTION," or "U/C," whichever is appropriate. Ruins other than buildings should be outlined as usual but labeled "RUIN" in addition to any required labels. See also "Area Under Construction."

Trailer Park

Digitize edge of trailer park as apparent from lot location, property lines, etc. Do not show trailers within

trailer parks. Show drives over 400 ft long. Label "TRAILER PARK."

Dam

Barrier across river, creek, or swamp to regulate or obstruct water flow. Label "DAM."

Tank (Visible)

Public utility storage tank. Digitize edge of tank. Label "TANK."

Silo (Visible)

Large cylindrical receptacle for farm product storage. Label "SILO."

Cemetery

Delineate cemetery boundary only if not bounded by a fence line. Show paved drives over 400 ft long. Label "CEMETERY."

Fence

Digitize center lines of all visible cross-country fences.

Residential Retaining Wall (Minor)

Fixed structure retaining earth, not located along a thoroughfare. Digitize center line of walls over 40 ft long and pattern so ticks are on high side of wall. Retaining wall has precedence over fence, edge of pavement, and hydrology. Major retaining wall has precedence over minor retaining wall. Snap contours to retaining walls.

Ornamental Wall (Visible)

Fixed structure of concrete or brick not used for retention of earth. Digitize center line of walls over 40 ft long. Ornamental wall has precedence over fence or cemetery.

Broadcast Antenna

Radio or television tower. Digitize center of tower.

Miscellaneous Feature

Items not classified as minor buildings, such as conveyors or crane tracks. Label if identifiable.

Field Line (Special Request Only)

A change between plowed fields indicating a property line. Often apparent by a difference in crop or type of furrow. Digitize center line of rural field lines only.

Golf Course

Show outline of golf course only if not bounded by a fence. Do not digitize tees, greens, or sand traps except

upon special request. Show all paved drives (cart paths) that are permanent in nature and over 400 ft long. Show all hydrology and natural features. Label "GOLF COURSE" with only enough frequency for identification.

Athletic Field

Outline field only if not depicted by fence. Do not label. Show paved or unpaved tracks as paved or unpaved drives.

Debris (Visible)

Scattered and unsorted material completely obscuring ground. Digitize outline of area and label "DEBRIS." Do not contour.

Storage

Stacked material or piles of dirt, sand, gravel, salt, etc., completely obscuring ground. Digitize outline of area and label "STORAGE." Retaining wall symbology takes precedence over storage outline. Outline visible junkyards and label "JUNKYARD."

Quarry

Mining area. No distinction is made between rock (consolidated) material mines and loose (unconsolidated) material mines. Show natural features present within quarry. Digitize quarry outline and label "QUARRY" with only enough frequency to identify feature. Contour inactive quarries only. Place spot elevations at lowest points of active quarries.

Area Under Construction

Digitize outline of entire area under construction that is visible. Show any roads under construction as unpaved roads. Digitize buildings under construction, and any feature that has been completed (e.g., completed building). Label "AREA UNDER CONSTRUCTION" or "AREA U/C." Do not show debris or storage within the area outline. Do not contour.

Pipeline

Cross-country aboveground pipeline used for transportation of liquid, gas, or matter, usually found near industrial areas or public utilities plants. Digitize center line; label "PIPE." Do not show supporting structures.

Underground Pipeline

Digitize center line of apparent underground pipelines. Label "U/G PIPE."

Levee

Earth wall for fluid retention, usually found along rivers

or canals. Digitize outline of top of levee visible on planimetric maps only (contours define levees on topographic maps). Label "LEVEE."

Riprap (Over 40 ft x 40 ft)

Rocks placed along slopes to lessen erosion. Outline large riprap area and label "RIPRAP." Contour general slope of riprap with dashed contours to represent non-permanent irregular surface.

Commercial Pier

Deck supported by posts extended over water. Digitize edge of pier. Do not show private piers. Label "PIER."

Jetty

Structure, usually earth or concrete, extended from shore to lessen erosion. Delineate any other features such as retaining walls or slabs. Do not label. Place spot elevations at high and low points of jetty.

E-26. Natural Features

River

Navigable stream. Digitize shorelines.

Lake

A large inland body of usually fresh water. Show man-made reservoirs as lakes. Digitize shoreline. Join lake outline cleanly with river or creek line.

Pond (Visible)

A body of standing water much smaller than a lake, often man-made. Digitize shoreline. Join pond outline cleanly with stream. If small pond is attached to a river or lake, include in river or lake outline.

Swamp

Area of spongy, wet ground, usually harboring vegetation. Digitize any river, lake, pond, or creek outline within the swamp. Digitize outline of swamp and place cells in the swamp area. No distinction is made between a swamp, marsh, or inundated area. Show all vegetation within the swamp area.

Creek (Visible)

Nonnavigable stream. Digitize center lines of streams. Join creeks cleanly with rivers, lakes, or ponds.

Tree Mass

Group of trees. Digitize edge of tree mass by following outline along the outer edge of the tree trunks. Tree

mass lines cannot cross over any double-wide linear feature or any railroad line, regardless of canopy spread.

E-27. Drainage Structures

Concrete Headwall

Concrete on the end of a transverse drain or pipe culvert. Digitize the center line of visible headwalls.

Paved Ditch Over 40 ft Long

Digitize center line of visible paved ditch. Retaining wall has precedence over paved ditch. Join cleanly with headwalls, if present.

E-28. Utilities

Transmission Tower

Large structure for supporting power lines across long distances. Digitize base of tower.

Substation Greater Than 40 ft × 40 ft

High-voltage units grouped together, usually within a fence. Digitize outline. Show large structures within substations as miscellaneous structures. Substation outline has precedence over unpaved drive. Do not show individual poles, pipes, or transformers within substation boundary. Label "SUBSTATION."

E-29. Contours

Index Contour

Every fifth contour shall be annotated and shall have a thicker line weight than intermediate contours. Do not break index contours for spot elevations unless absolutely necessary for legibility. Do not drop index contours. If the contours are absolutely too close to pull indexes through, such as on a cliff or in a quarry, every fifth index is to be pulled through and the others are to drop cleanly.

Hidden Index Contour

Indexes that are obstructed by dense vegetation shall be delineated as hidden index contours. The guidelines for index contours apply to hidden index contours also.

Depressed Index Contour

See E-7*b* above. Follow the same guidelines as for index contours.

Hidden Depressed Index Contour

Depression index obstructed by dense vegetation. Follow the same guidelines as for index contours.

Index Contour Label

Label shall be placed on line of index contour in such a manner that the bottom of the number corresponds to the ground that is lower than the index elevation. Intermediates may be broken for index labels if necessary.

Intermediate Contour

Four intermediates exist between two index contours. Do not show any more or any less than four. Do not drop intermediate contours unless the indexes are less than 1/4 in. apart at map scale. Intermediates should not run through spot elevations. Intermediates can be broken for other text as well.

Hidden Intermediate Contour

Intermediate contour that is obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

Depressed Intermediate Contour

See E-7*b* above. Follow the same guidelines as for intermediate contours.

Hidden Depressed Intermediate Contour

Depressed intermediate contour obstructed by dense vegetation. Follow the same guidelines as for intermediate contours.

Spot Elevation

Supplemental elevation used in conjunction with contour information. Spot elevations should be placed at the following points:

- (1) All road and/or railroad intersections.
- (2) At top of bridges on center line of road.
- (3) At center line of roads above culverts.
- (4) At the highest point of closed contour tops.
- (5) At the lowest point of closed depressions, significant saddles, and quarries.
- (6) At points visible through dense vegetation in obscured areas.

(7) At any location necessary to provide that no more than 2 in. exist between any contour and/or spot elevation.

Indexes, intermediates, and tree mass patterns are the only features to be broken for spot elevation text. Spot elevations are to be rotated parallel to the bottom of the sheets unless otherwise requested.

Water Elevation

Elevation of surface of water. Place at or near the center of the water body itself or the water body shown on the model. Do not show water elevations on single-wide creeks or ditches.

E-30. Manuscript Data

Contour Limit Line

Show line only if project has adjacent areas of planimetric and topographic detail. Contours should end exactly upon this line. Also show a contour limit line between adjacent areas where the contour interval changes.

Match Line

Place line at edge of graphic detail to allow for a butt match to adjacent sheets. Place only on edges where matching sheets exist.

Model Limit Line

Digitize edge; pull all detail cleanly to line. Do not plot model limit lines on final plots.

Horizontal Control Point

Place at coordinates and label. Show only if horizontal control is separate from vertical control.

Vertical Control Point

Place at its true position during stereocompilation and label. Show only if horizontal control is separate from vertical control.

Control Point

Point used for both horizontal and vertical control. Place at coordinates and label.

Control Point Annotation

List point number. North and east coordinate values are to be shown on horizontal points; elevations are to be shown on vertical points. Use commas.

Grid Tick

Place grid tick at grid line intersections (every 5 in. at map scale). Label outside of graphic detail such that each grid is labeled once.

Grid Lines (Special Request Only)

Place lines every 5 in. at map scale at even grid coordinates. End cleanly at match lines or neat lines.

Grid Annotation

Place as appropriate. Use commas.

Standard Border

Center border around graphic detail. List project, client name, scale, contour interval, map type, sheet number and index of all sheets, month of photography, and grid north.